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## COMPLETE SPECIFICATION.

## Improvements in and relating to the Production of Egg Yolk Substitutes.

We, HANSEATISCHE MÜHLENWERKE AKTIENGESELLSCHAFT, of Alsterdamm 3, Hamburg, Germany, a joint-stock Company registered under German laws, and Dr. BRUNO ALBERT REWALD, of Alsterdamm 3, Hamburg, Germany, a German Citizen, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

The invention concerns a process for the production of egg yolk substitute.

It has already been attempted for many purposes to employ phosphatide as a substitute for yolk. It has appeared, however, that phosphatides as a result of their smooth and waxy consistency are difficult to mix with other materials and that phosphatides cannot, as can natural egg yolk which is in the liquid form, be used for the production of bakery goods, goods made from dough, sauces and the like. It has, therefore, already been attempted to dissolve phosphatides in oils and fats in particular gelatinous fats and so to obtain a mixture which allows good admixture in many materials but shows, however, the disadvantage that the phosphatide very readily separates from the solution and that further the considerable content of oil or fat is unsuitable for many purposes.

It has now been found that in the production of foodstuffs comprising egg yolk, it is possible to utilise a composition wherein approximately 5 to 30% by weight of phosphatide such as lecithin is emulsified in egg yolk. In this way a substantial economy of egg yolk can be effected, the phosphatide in the emulsion so produced having the effect in the production of foodstuffs of replacing the egg yolk.

Such a liquid product according to the invention can for example be obtained in the following manner:

1 part by weight of lecithin, for example soya lecithin, and 2 parts by weight of water are first mixed to an aqueous lecithin emulsion which preferably is obtained at a temperature of from 50 to 60° C. together with an addition

[Price 1/-]

of a drop of ammonia. The aqueous emulsion so obtained is then mixed, for example, with an equal proportion of egg yolk. As the natural egg yolk has a lecithin content of about 8% by weight a product is obtained having all the characteristics of egg yolk, with a high lecithin content of 15—18% by weight which can replace egg yolk universally. The product according to the invention can be rendered storable in exactly the same manner as egg yolk.

According to the invention a cheap egg yolk substitute is obtained. It can be utilised for the production of baked goods of all kinds, of goods made with dough, egg foods, puddings and the like, and can be universally employed where hitherto egg yolk has been used.

It has appeared that the products according to the invention are above all suitable for the production of acid-containing foodstuffs. Hitherto it was not possible to obtain emulsions solely of lecithin resistant against acids since these are always flocculated by acids in the smallest concentration. By the addition of albuminous compounds which, so to say, act as protective colloids, the phosphatides are stabilised.

According to the invention it is possible to obtain relatively high lecithin concentrations which are completely stable against acids particularly acetic acid or citric acid which are common in foodstuffs, in particular in mayonnaises, so that they can be applied for the desired purposes without further treatment. Practically, the process is preferably such that the lecithin either as such or in admixture with oil, for example 50 parts by weight of lecithin and 50 parts by weight of oil, is stirred up with an equal quantity of water. A lecithin oil emulsion is obtained of which 1 part by weight can then be mixed with 1 part by weight of fluid egg yolk. In this way a preparation is obtained which has the following approximate composition by weight:

50% liquid egg yolk  
12.5% liquid earth nut oil  
12.5% lecithin  
25% water.

Since normally in liquid egg yolk only 9% by weight of lecithin is contained, so in the above composition only 4.5% by weight is lecithin derived from the egg yolk component or about 25% of the total lecithin content of the above emulsion.

It is also without further treatment possible to increase the lecithin content without that the resistance of the product is appreciably deteriorated.

According to the invention a cheap material is formed which is suitable for the production of mayonnaise with the use of lecithin.

Moreover, with the products in the invention, sauces, in particular thick sauces, such as are used for salads, fish dishes, foodstuffs and the like, for example Remouladensauce (Ger.) can be produced with advantage.

The process is also suitable for the production of creams, for example lemon curd and the like and similar materials employed in cooking and in bakeries. Also the present process is suitable for fish salads and meat salads, for example Italian salads and the like dishes which are acidic and are obtained with addition of eggs.

The egg yolk substitute according to the present invention can also be used for the production of acidic and other

dishes and foodstuffs in other circumstances and is universally usable where hitherto egg yolk has been necessary, for example in the production of baked goods, of soups, puddings and the like.

Having now particularly described and ascertained the nature of our said invention and in what manner the same is to be performed, we declare that what we claim is:—

1. In the production of foodstuffs normally comprising egg yolk the use in place of egg yolk normally employed of a composition comprising lecithin substantially in the proportions set forth emulsified in egg yolk as and for the purposes specified.

2. A process as claimed in claim 1, in which the emulsion has a content of about 5 to 30% by weight of additionally emulsified lecithin.

3. A process as claimed in claim 1 or 2, in which the lecithin is incorporated with the egg yolk in the form of a concentrated aqueous emulsion.

4. The production of foodstuffs comprising lecithin emulsified in egg yolk substantially as described.

Dated this 22nd day of August, 1932.

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